APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/701,705	12/01/2000	Yukihiko Okumura	15689.61	7195

7590 07/13/2006	EXAMINER
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ART UNIT	PAPER NUMBER
2611	

DATE MAILED: 07/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
	09/701,705	OKUMURA ET AL.
Office Action Summary	Examiner	Art Unit	
	Qutub Ghulamali	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>04 May 2006</u>.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4-8,18-20,22,23,33-37,47,49,51 and 53-84* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *5,19,54-61 and 70-77* is/are allowed.

6)☒ Claim(s) *1,2,4,6-8,18,20,22,23,33-37,47,49,51,53,62-69 and 78-84* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date <u>2/13/2006</u>.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

1.   This Office Action is in response to Remarks/Arguments filed by the applicant on

05/04/2006.

Response to Arguments

2.   Applicant's arguments filed 05/04/2006, regarding the rejection of claims 1, 2, 4,

6- 8, 18, 20, 22, 23, 33-37, 47, 49, 51, 53, 62-69 and 78-84 have been fully considered

but they are not persuasive.

The Applicant alleges, see page 2-3, that:

1) Abeta does not determine said weighting factors according to the positions.

2) Regarding independent claims 53, 62, 69 and 78, Abeta does not disclose

"weighted averaging of pilot signals in time".

Examiners response:

1) The examiner most respectfully would like to state that the weighting factors

are determined according to the position of pilot symbols has been interpreted by the

examiner in its broadest application of the meaning in terms of claim interpretation to

mean - placing the weights of the pilot blocks that include pilot symbols closer to the

pilot symbols closer, which is considered to mean closer in time. Abeta discloses this

feature recited in claims 11, 8, 18, 23, 33, 37, 47, 49 and 51, see col. 8, lines 9-15 and

figs. 3, 10-13. The examiner believes that the interpretation provided and that the clear

disclosure in Abeta, satisfy the claim limitation of "determine weight factors according to

the positions".

2) The examiner most respectfully would like to draw applicant's attention to

Abeta, wherein Abeta, discloses "weighted averaging of pilot signals (symbols) in time"

by describing the weights of the pilot blocks that include pilot symbols to be closer in

time, see Abeta col. 8, lines 9-15. Based on the disclosure provided in Abeta the

examiner believes the limitation of above claims is unambiguously satisfied.

Therefore, as per explanation provided in response to remarks by the applicant,

the claim rejection is maintained.

Claim Rejections - 35 USC § 112

3.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly
> claiming the subject matter which the applicant regards as his invention.

4.   Claims 1, 8, 18, 23, 33, 37, 47, 49 and 51 are rejected under 35 U.S.C. 112,

second paragraph, as being indefinite for failing to particularly point out and distinctly

claim the subject matter which applicant regards as the invention.

Claims 1, 8, 18, 23, 33, 37, 47, 49 and 51 recites the limitation "the slots" in lines

9, 12, 12, 14, 12, 14, 9, 11 and 11 respectively There is insufficient antecedent basis

for this limitation in the claims.

Claim Rejections - 35 USC § 103

5.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains.
Patentability shall not be negatived by the manner in which the invention was made.

6.   Claims 1, 2, 4, 6-8, 18, 20, 22, 23, 33-37, 47, 49, 51, 53, 62-69, 78-84 are

rejected under 35 U.S.C. 103(a) as being unpatentable over Abeta et al (USP

6,647,003) in view of Huang et al (USP 5,881,056).

Regarding claims 1, 18, 23, 33, 37, 47, 49, 51, 64, 65, 67, 68, and 83, Abeta,

discloses a channel estimation and demodulation device comprising:

weighting factor generating means for generating weighting factors for weighting and

averaging pilot symbols which are time multiplexed with a control channel, which is

parallel multiplexed with a data channel (abstract; col. 2, lines 54-65; col. 8, lines 24-28;

col. 9, lines 19-24), and

channel estimation value calculating means for weighting and averaging said pilot

symbols using said weighting factors and calculating a channel estimation value of data

symbols of said data channel (figs. 2, 5, elements S201-S205, S501-S506; col. 4, lines

8-42) wherein weighting factors are determined according to the positions of said pilot

symbols in the slots of said control channel (col. 7, lines 63-67; col. 8, lines 1-15).

Regarding claim 8, Abeta discloses demodulation means comprising:

weighting factor generating means for generating weighting factors to be used for

weighting and averaging pilot symbols being time multiplexed in a control channel that

was parallel multiplexed together with a data channel (col. 2, lines 54-59);

channel estimation value calculating means for weighting and averaging said pilot

symbols using said weighting factors and for calculating a channel estimation value of

data symbols of said data channel (figs. 2, 5, elements S201-S205, S501-S506; col. 4,

lines 8-42); and

channel variation (fluctuations) compensating means for compensating channel

variation of said data symbols using the channel estimation value calculated by said

channel estimation value calculating means (col. 3, lines 10-15),

wherein weighting factors are determined according to the positions of said pilot

symbols in the slots of said control channel (col. 7, lines 63-67; col. 8, lines 1-15).

Abeta further discloses channel variation compensating means for compensating

channel variation of said data symbols using the channel estimation value calculated by

said channel estimation value calculating means (col. 2, lines 3-8, 39-48). Abeta,

though discloses multiplexing of data and control channel (pilot), however, does not

clearly express the limitation "pilot symbols time multiplexed with a data channel".

Huang in a similar field of endeavor discloses this operation via the complex processor

implementation of pilot symbols time multiplexed with a data channel (col. 9, lines 3-16,

56-62). It would have been obvious to a person of ordinary skill in the art at the time the

invention was made to use a time multiplexing scheme as taught by Huang in the

channel estimation apparatus of Abeta because it can track and acquire timing

information for channel sub code and further to control the reception of and dispreading

of all the remaining sub codes.

Regarding claims 2, 20, 34, Abeta discloses said weighting factor generating

means generates weighting factors to be used for weighting and averaging mean values

of the pilot symbols in a plurality of slots of said control channel and said channel

estimation value calculating means weights and average the mean values of said pilot

symbols using said weighting factors and calculates the channel estimation value of the

data symbols of said data channel (col. 2, lines 53-65).

Regarding claims 4, 66, Abeta discloses said weighting factor generating means

divides the data symbols in the slots of said data channel into a plurality of data symbol

sections, selects

the pilot symbols appropriate for calculating the channel estimation value of the data

symbols in each of the data symbol sections and generates the weighting factors to be

used for weighting and averaging the pilot symbols (col. 2, lines 53-65); and

said channel estimation value calculating means takes weighted average of said pilot

symbols using said weighting factors and calculates the channel estimation value of the

data symbols of each of the data symbol sections (abstract; col. 2, lines 39-46, 54-58).

Regarding claims 6 and 35, Abeta discloses fading frequency decision means for

deciding the fading frequency based on an inner product value of said pilot symbols

(col. 1, lines 66-67; col. 2, lines 1-8, 39-48); and

factor altering means for altering the factors that are used in taking said weighted

average according to the fading frequency decided by said fading frequency decision

means (col. 7, lines 50-67; col. 8, lines 1-18).

Regarding claims 7, 36, Abeta discloses a transmission rate of said data channel

differs from the transmission rate of said control channel (col. 1, lines 55-61).

Regarding claim 22, Abeta discloses channel estimation further comprising

fading frequency decision means (processor receiving spread data symbol sequence)

for deciding the fading frequency based on the inner product value of pilot symbols (col. 3, lines 55-61; col. 4, lines 9-25); and

factor altering means for altering the factors to be used for taking said weighted averaging according to the fading frequency decided by said fading frequency decision means (col. 3, lines 59-63).

Regarding claim 53, Abeta discloses a demodulating device comprising:

channel estimating means for deriving N (N is natural number greater than or equal to two) in number of channel estimation values by weighted averaging of pilot signals in time using N in number of weighted sequences (col. 14, lines 10-18);

compensating means for compensating data sequences using said respective channel estimation values (col. 2, lines 3-8, 39-48);

RAKE combining means for RAKE combining respective of said N data sequences after compensation (col. 8, lines 29-43); and

reliability judgment (highly accurate, accuracy) means for selecting one data sequence having highest reliability from said N data sequences after RAKE combination (col. 9, lines 5-13).

Regarding claims 62, 63, Abeta discloses a demodulating device comprising:

channel estimating means for weighted averaging of reception pilot signals using a plurality of weighting sequences and deriving a plurality of channel estimation values (col. 14, lines 10-18);

demodulating means for inputting data sequences and outputting a plurality of

demodulated data sequences using said plurality of channel estimation values (col. 2,

lines 59-67; col. 3; lines 1-15; and

reliability judging means (highly accurate, accuracy) for selecting one demodulated data

by making judgment of reliability (accuracy) of said plurality of demodulated data

sequences (col. 9, lines 5-13).

Regarding claims 69, the steps claimed as method is nothing more than restating

the function of the specific components of the apparatus as claimed above and

therefore, it would have been obvious, considering the aforementioned rejection for the

apparatus claim 53.

Regarding claims 78, the steps claimed as method is nothing more than restating

the function of the specific components of the apparatus as claimed above and

therefore, it would have been obvious, considering the aforementioned rejection for the

apparatus claim 62.

Regarding claims 79, Abeta discloses based on the judgment (determination)

said plurality of demodulated data sequences, a predetermined number of weight

sequences are selected from among said plurality of weight sequences, and after the

selection, demodulation through the use of only the selected weight sequences is

performed (col. 2, lines 28-33, lines 39-48, lines 50-65).

Regarding claim 80, Abeta discloses said pilot signals are time multiplexed into a

control channel that is parallel multiplexed together with the data channel in which said

data sequence is contained (abstract; col. 2, lines 54-65; col. 8, lines 24-28; col. 9, lines 19-24).

Regarding claim 81, Abeta discloses all of the claim limitation above except said pilot signals are time multiplexed into one channel together with the data sequence. Huang in a similar field of endeavor discloses pilot signals are time multiplexed into one channel together with the data sequence (abstract; col. 9, lines 59-63; col. 10, lines 4-24). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a time multiplexing scheme as taught by Huang in the channel estimation apparatus of Abeta because it can track and acquire timing information for channel sub code and further to control the reception of and dispreading of all the remaining sub codes.

Regarding claims 82 and 84, Abeta discloses demodulation method wherein estimating a channel divides the data symbols in the slots of said data channel into a plurality of data symbol sections, selects the pilot symbols appropriate for calculating the channel estimation value of the data of each of the data sequence sections and calculates a channel estimation value of the data of each data sequence sections by weighting and averaging the selected pilot signals (col. 2, lines 53-65; col. 7, lines 20-67).

Allowable Subject Matter

7.   Claims 5, 19, 54-61 and 70-77 allowed.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Qutub Ghulamali whose telephone number is (571) 272-3014. The examiner can normally be reached on Monday-Friday, 7:00AM - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

QG.
June 29, 2006.
Examiner,
AU-2611.

MOHAMMED GHAYOUR
SUPERVISORY PATENT EXAMINER